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Sir Isaac Newton and Indian Coins

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Introduction

One may wonder what Sir Isaac Newton (1642-1727) to do with India[1], that too, with Indian coins, but definitely, he has many things to do with Indian coins, when he became Warden (1696-1699) and then the Master of Royal Mint, London (1699-1727). Of course, his interest in historical chronology, particularly that of ancient Kingdoms has been unnoticed by many historians[2]. In 1717, after studying the coins of India and other eastern countries, he decided to bring Gold Standard to England, as hitherto, Silver was used as standard[3]. Moreover, he found out that Gold was cheaper, whereas Silver costlier in India, thus, he found the British exported Silver to India and brought Gold to England[4]. Not only, the connection of Newton with India, but also large scale official and unofficial export of Indian silver and golden coins after 18th century from India[5] has also not been studied properly. Here, some of the aspects are taken up for discussion in the context of numismatics.

Newton as a Warden (1696-1699) and Master of Royal Mint (1699-1727)[6]

New money was introduced subsequent to introduction of legislation by Montague based on Locke. To manage his coinage, he required an unscrupulous individual, who could be stringent enough to administer law and enforce penalty of death against alleged counterfeiters. Thus, Newton was chosen as the proper person for the post and appointed as Warden on April 13, 1696. For three years, he managed the coinage and prosecuted even the pettiest counterfeiter with death penalty, wherever possible. His authoritarian ruthlessness[7] earned him the lucrative post of Master of Mint within three years, which he held from 1699 to 1727 till his death. Apart from the recoinage of 1696, through which he piloted the nation, apart too from the adventitious drama of Wood's halfpence, and Swift's nefarious rancour, these years witnessed that change in the relative values of the precious metals which virtually consecrated England to gold. Newton contented himself with official reports to the Lords of the Treasury on the subject of exchange, or on the state of the coins.

Problems of the Royal Mint[8]

In the eighteenth century, English economy though growing, it was plagued with the shortage of supply of money. The shortage of coins available for daily activities, even for paying wages and purchasing common goods resulted in discordance and inconvenience. It was due mainly to the wretched condition of the Royal Mint. The specialists – Assayers, Melters, Refiners, Engravers and Medallists, of the Royal Mint were allowed to carry out contract work in addition to their normal public duties. A small fixed annual payment from the government was guaranteed to the individual moneyer, but the bulk of his income came primarily from commission on private contracts. Thus, private accounts often took precedence over orders from the Treasury.

The shrinking number of moneyers was also contributed to the shortage of coins. The astronomical cost of apprenticeship restricted the membership to the company, contributing to the coin shortage problem.

The European Rivalry Contributes to Coin Crisis

The standard of money had always been based on Silver in England. The introduction and subsequent widespread use of the Spanish guinea[9] in the late seventeenth century, England was forced to assign a value to her gold coin. The comparative values of Gold and Silver in India, England and other countries were as follows:

Country	*Pounds of Silver*	*Pounds of Gold*
England	15.5	1
Spain	16	1
India	12	1
Japan	9	1

So in India, with 9 pounds of Silver, England could buy one pound of gold, whereas, it had to shell out 16 pounds in Spain and 15.5 pounds in England. Of course, Japan, it was still cheaper. So the table shows the worth of Silver relative to gold in the early years of the eighteenth century. Thus naturally, the Spanish took advantage of the conversion to import Silver bullion and exchange it for gold. There were restrictions in the export of precious metals, particularly, in the form of bullion or foreign coin, but not in coins of the realm under the British Act and Rules. But, as "the opportunity of gain" remained irresistible, and many "money jobbers" and "exchange dealers" melted the heaviest silver coins available to export to India and Japan. In 1712, Sir Isaac Newton declared, *"gold in England is overvalued in proportion to silver ... and this excess value tends to increase the gold coins and diminish the silver coins of this kingdom."* Newton's advice was ignored until 1717, when the guinea was revalued from 21s 6d to 21s, however, the measure could not control the depletion of English silver to foreign countries and it was a practice that was neither curtailed nor compensated for in the eighteenth century, because of other interests.

Sir Isaac Newton's Letter[10] to the Lord of Commoners on the "State of Gold and Silver Coins

For the relevancy of the subject matter, Newton's letter is reproduced verbatim as appearing in the website:

"To the Rt. Honble. the Lords Commrs. of his Mats Treary.

MAY IT PLEASE YOR LORDS.,–

In obedience to yor Lordps. Order of Reference of Aug. 12 that I should lay before yor Lordps. a state of the Gold & Silver Coyns of this Kingdom in weight & fineness, & the value of gold in proportion to silver with my observations & opinion, & what method may be best for preventing the melting down of the silver coyn, I humbly represent that a pound weight Troy of Gold, eleven ounces fine & one ounce allay, is cut into 44½ Guineas, & a pound weight of silver, 11 ounces, 2 pennyweight fine, & eighteen pennyweight allay is cut into 62 shillings, & according to this rate, a pound weight of fine gold is worth fifteen pounds weight six ounces seventeen pennyweight & five grains of fine silver, recconing a Guinea at 1£, 1s. 6d. in silver money. But silver in Bullion exportable is usually worth 2d. or 3d. per ounce more then in coyn. And if at a medium such bullion of Standard allay be valued at 5s. 4½d. per ounce, a pound weight of fine Gold will be worth but 14 lbs. wt., 11 oz. 12 dwt. 9 grs. of fine silver in bullion. And at this rate a guinea is worth but so much silver as would make 20s. 8d. When ships are lading for the East Indies, the demand of silver for exportation raises the price to 5s. 6d. or 5s. 8d. per ounce or above. But I consider not those extraordinary cases.

A Spanish Pistole was coyned for 32 Reaus, or four pieces of eight Reaus, usually called pieces of eight, & is of equal allay & the sixteenth part of the weight thereof. And a Doppio Moeda of Portugal was coyned for ten Crusados of Silver, & is of equal allay, & the sixteenth part of the weight thereof. Gold is therefore in Spain &

Portugal of sixteen times more value then silver of equal weight & allay, according to the standard of those Kingdoms. At wch rate a Guinea is worth 22s. 1 d. But this high price keeps their gold at home in good plenty, & carries away the Spanish Silver into all Europe, so that at home they make their payments in Gold, & will not pay in Silver without a premium. Upon the coming in of a Plate fleet, the premium ceases or is but small: but as their silver goes away & becomes scarce, the premium increases, & is most commonly about six per cent. Which being abated a Guinea becomes worth about 20s. & 9d. in Spain & Portugal.

In France a pound weight of fine gold is recconed worth fifteen pounds weight of fine silver. In raising or falling their money, their kings' Edicts have sometimes varied a little from this proportion in excess or defect: but the variations have been so little that I do not here consider them. By the Edict of May 1709, a new Pistole was coyned for four new Lewises, & is of equal allay & the fifteenth part of the weight thereof, except the errors of their Mints. And by the same Edict fine Gold is valued at fifteen times its weight of fine silver. And at this rate a Guinea is worth 20s. 8½d. I consider not here the confusion made in the monies in France by Frequent Edicts to send them to the Mint, & give the king a Tax out of them. I consider only the value of Gold & Silver in proportion to one another.

The Ducats of Holland & Hungary & the Empire were lately current in Holland among the common people in their markets & ordinary affairs at five Guilders in specie, & five styvers, & commonly changed for so much silver moneys in three Guilders, and guilder pieces as guineas are with us for 21s. 6d., at which rate a guinea is worth 20s. 7½d. According to the rates of Gold to Silver in Italy, Germany, Poland, Denmark, & Sweden, a Guinea is worth about 20s. & 7d., 6d., 5d., or 4d. For the proportion varies a little within the several goverments in those countries. In Sweden Gold is lowest in proportion to silver, & this hath made that kingdom, which formerly was content with copper money, abound of late with silver sent thither (I suspect) for naval stores.

In the end of King William's reign, & the first year of the late Queen, when foreign coyns abounded in England, I caused a great many of them to be assayed in the Mint & found by the assays that fine Gold was to fine Silver in Spain, Portugal, France, Holland, Italy, Germany, & the northern kingdoms, in the proportions above mentioned, errors of the Mints excepted.

In China and Japan one pound weight of fine gold is worth but nine or ten pounds weight of fine silver, & in East India it may be worth twelve. And this low price of gold in proportion to silver carries away the silver from all Europe.

So then by the course of trade & exchange between nation & nation in all Europe, fine gold is to fine silver as $14^{4/5}$ or 15 to one. And a Guinea at the same rate is worth between 20s. 5d. & 20s. 8½d., except in extraordinary cases, as when a Plate Fleet is just arrived in Spain, or ships are lading here for the East Indies, which cases I do not here consider. And it appears by Experience as well as by reason that silver flows from those places where its value is lower in proportion to gold, as from Spain to all Europe, & from all Europe to the East Indies, China & Japan, & that Gold is most plentifull in those places in which its value is highest in proportion to Silver, as in Spain & England.

It is the demand for exportation which hath raised the price of exportable Silver about 2d. or 3d. in the ounce above that of Silver in coyn, and have thereby created a temptation to export or melt down the silver coyn rather then give 2d. or 3d. for forreign silver. And the demand for exportation arises from the higher price of silver in other places then in England in proportion to Gold, that is, from the higher price of gold in England then in other places in proportion to silver; & therefore may be diminished by lowering the value of gold in proportion to Silver. If gold in England or Silver in East India could be brought down so low as to bear the same proportion to one another in both places, there would be here no greater demand for silver then for gold to be exported to India. And if Gold were lowered only so as to have the same proportion to the silver money in England, wch it hath to silver in the rest of Europe, there would be no temptation to export silver rather then gold to any other part of Europe. And to compass this last there seems nothing more requisite then to take of about 10d. or 12d. from the guinea, so that gold may beare the same proportion to the silver money in England, which it ought to do by the course of Trade & Exchange in Europe. But if only 6d. were taken off at present, it would deminish the

temptation to export or melt down the silver coyn, & by the effects would shew hereafter better then can appear at present, what further reduction would be most convenient for the Publick.

In the last year of K. William, the Dollars of Scotland, worth about four shillings & six pence half penny, were put away in the north of England for 5s., and at this price began to flow in upon us. I gave notice thereof to the Lords Commrs. of the Treasury, & they ordered the collector of Taxes to forbear taking them, & thereby put a stop to the mischief.

At the same time the Lewidors of France, which were worth but seventeen shillings & three farthings a piece, passed in England at 17s. 6d. I gave notice thereof to the Lds. Commissioners of the Treasury, and his late Maty. put out a Proclamation that they should go but at 17s., & thereupon they came to the Mint, and fourteen hundred thousand pounds were coyned out of them. And if the advantage of five pence farthing in a Lewidor sufficed at that time to bring into England so great a quantity of French money, & the advantage of three farthings in a Lewidor to bring it to the Mint, the advantage of 9[1]d. in a Guinea or above may have been sufficient to bring in the great quantity of gold which hath been coined in these last fifteen years without any forreign silver.

Some years ago the Portugal Moedors were received in the West of England at 28s. a piece. Upon notice from the Mint that they were worth only about 27s. 7d., the Lords Commissioners of the Treasury ordered their Receivers of Taxes to take them at no more than 27s. 6d. Afterwards many gentlemen in the west sent up to the Treasury a Petition that the Receivers might take them again at 28s., and promised to take them again at the same rate [erased], to get returns for this money at that rate, alledging that when they went at 28s. their country was full of gold, which they wanted very much. But the Commissioners of the Treasury, considering that at 28s. the nation would lose five pence a piece, rejected the Petition. And if an advantage to the Merchant of 5d. in 28s. did pour that money in upon us, much more hath an advantage to the merchant of 9½d. in a Guinea or above, been able to bring into the Mint great quantities of gold without any forreign silver, & may be able to do it still, till the cause be removed.

If things be let alone till silver money be a little scarcer, the Gold will fall of itself. For people are already backward to give Silver for Gold, and will in a little time refuse to make payments in Silver without a premium, as they do in Spain, & this premium with be an abatement in the value of the gold. And so the question is whether Gold shall be lowered by the government, or let alone till it falls of itself by the want of silver money.

It may be said that there are great quantities of silver in Plate, & if the Plate were coyned there would be no want of Silver money. But I reccon that silver is safer from exportation in the form of plate then in the form of money, because of the greater value of the Silver & fashion together. And therefore I am not for coyning the Plate till the temptation to export the silver money (wch has a profit of 2d. or 3d. an ounce) be diminished. For as often as men are necessitated to send away money for answering debts abroad, there will be a temptation to send away Silver rather then Gold, because of the profit which is almost 4 per cent. And for the same reason forreigners will chuse to send hither their gold rather then their Silver.

All which is most humbly submitted to yor Lordps. great wisdome.

IS. NEWTON.
MINT-OFFICE,
21 *Sept.* 1717.

Newton Making Decision against India

Newton has not minced his words in the above letter in the following points:

- In China and Japan one pound weight of fine gold was worth but nine or ten pounds weight of fine silver, and in East India it was worth twelve. And this low price of gold in proportion to silver carried away the silver from all Europe.
- So then by the course of trade and exchange between nation and nation in all Europe, fine gold is to fine silver as 14⁴/5 or 15 to one. And a Guinea at the same rate was worth between 20s. 5d. & 20s. 8½d.,

except in extraordinary cases, as when a Plate Fleet was just arrived in Spain, or ships were lading here for the East Indies.

- Gold was most plentiful in those places (including India) in which its value was highest in proportion to Silver, as in Spain and England.
- It was the demand for exportation which hath raised the price of exportable Silver about 2d. or 3d. in the ounce above that of Silver in coin, and had thereby created a temptation to export or melt down the silver coin rather then give 2d. or 3d. for foreign silver.
- And the demand for exportation arose from the higher price of silver in other places then in England in proportion to Gold, i.e, from the higher price of gold in England then in other places in proportion to silver and therefore, may be diminished by lowering the value of gold in proportion to Silver.
- If gold in England or Silver in East India could be brought down so low as to bear the same proportion to one another in both places, there would be here no greater demand for silver then for gold to be exported to India.

He also set the price of silver at the same time and overvalued it relative to gold, as he could notice it because of trade deficits, the East India Company was shipping most of England's silver to India to pay for tea and spices, and probably overvalued it on purpose. It didn't matter since holders of silver quickly sold it and bought gold for the one time arbitrage, but it was the end for silver in England. Therefore, England's dealing with India in this aspect during the material period was definitely known to Newton and his authority as a Master of the Royal Mint served well for the British colonial and economic pursuits.

Newton' Legacy Continued through his Brother-in-Law, John Conduitt (1727-1737)

John Conduitt who married Catherine Barton, the step-niece of Newton in 1717, succeeded Newton, when he died in 1927 and continued as the Master of Royal Mint till his death in 1937. Not only, has his tomb lain adjacent to Newton's Westminster Abbey. His writings on "Gold and Silver" resemble[11]. Unlike Newton, his writings succinctly posed sound and insight arguments in answer to the problems of the mint. Though, he wrote in 1730, his lengthy treatise was published only from a manuscript, which was in possession of the Irish Satirist, Jonathan Swift. John Conduitt specifically had dealt with the relationship between gold and silver in England as opposed to neighboring countries during the early 18th century and the necessity to bring the proportional value of the metals closely into line with their value in other European nations[12].

Gold from India for Making British Coins (1729-1739)

The British documents give the following details about the usage of gold from different sources chronologically:

Mark / Symbol	*Origin of Bullion*	*Period*
Elephant or elephant and Castle	Africa	1663-1726
Plumes	Wales	1698-1705
Roses	West of England mines	1699-1739 (not continuous)
VIGO	Captured from the Spanish fleet at VIGO Bay 1702	1703
Roses and Plumes	"Pitcoale & Seacole Company"	1705-1743
SSC	South Sea Company	1723
EIC	East India Company	1729-1739
LIMA	Silver captured by Admiral Austin	1745-1746

So for ten years from 1729 to 1739, that too during formative period, how EIC could have used bullion for minting British coins is the million dollar question! The VIGO coins clearly prove that the pirated gold was used for minting, throwing a new dimension in the context. Had these European Companies used Indian gold coins,

then, India must have lost its heritage through such looting, illegal export, piracy and minting. As there was no established numismatic study during the material period, many of numismatic evidences of Indian rulers, dynasties and the imprinted history on such coins must have been irrecoverably lost. This could be a possible answer for the absence of Mauryan gold coins, whereas, the succeeding Guptas had issued marvelous gold coins, even now available in the foreign collections. The latter British policy of accusing native mints melting British coins could have been a cover-up to their brutal closing down of Indian mints. That India used foreign coins for bullion value had been a well known fact since the Roman period. As the wanted Indian goods necessarily, they paid gold desperately to get them immediately. This gold procured- accumulated had gone to cover and decorate temples and cast images and was looted by the Muslims from medieval period onwards openly and by the British thereafter, stealthily and this, only perhaps, could be understood in the context. Thus, the usage of Indian coins for bullion value by the British could not be ruled out.

Newtonian Consequences in India

In spite of the Newton's advise, the problem was not settled. The Bank of England issued its own tokens to the value of three shillings and for one shilling and sixpence, as there had been no half-crowns minted since 1751 and the supply of overstrikes had proved inadequate, between 1811 and 1816. They weighed 15 grams and 7.5 grams respectively made of silver. The denominations were chosen so as not to conflict with crown prerogatives. The shortfall in silver coins brought about the minting of large numbers of silver provincial tokens from 1810 onwards, until outlawed in 1815. Therefore, why trend continued thereafter prove that England was loosing somewhere, in spite of huge gains from India.

Indian Coinage Act 1876 and Abolition of Indian Coinage

Indian Kings have been issuing coins since time immemorial, as the numismatists discuss about them elaborately. However, scholars[13] interpret that the falling fortunes of the Mughal Empire during the 18th century gave rise to a number of Indian powers that laid their claim for sovereignty. In the general scramble for independence, *'Sikka' or the right to coinage*, the most unmistakable insignia of sovereignty, became the right-most-cherished by these claimants. The European trading Companies assuming political character started interfering with the Indian rulers. Thus, the political ascendancy of various Indian as well as European powers during the 18th century was almost simultaneous, as perceived by the scholars interpreting that their interests in the matters concerning coinage and currency came in direct clash with each other. The British did not want to take any chance, that too, after the 1857 incidence and hence check India economically and thus, the Act No. IX of 1876 was passed by the Governor General of India in Council and received the assent of the Governor-General Lord Northbrook (1872-76) on the 28th March 1876. Incidentally, the year 1876-78 faced the great famine coupled with fever and cholera affecting Madras, Mysore, Heyderabad, Bombay and other parts of India.

Thus, draconian Acts and Rules were used to declare certain coins of the Native States to be a legal tender, thus holding other coins were illegal in British India. Even before the assumption of supremacy by the Crown, the Governor General Lord Hardinge had noted in 1845 that the abolition of Native mints was "the most effectual mode of introducing uniform currency." The Court of Directors of the East India Company too, in the dispatch dated 21 October 1846, had endorsed the stand taken by the Indian Government by emphasizing upon the necessity of "diminishing (when it can justly be effected) rather than increasing the number of Native Mints."

The Drain of Wealth from India

The "drain of wealth" by the British during the 200 years of colonial rule has been recorded by the scholars and they included gold, silver, diamonds, jewels and other valuables and goods. The plunder started with Plassey continued. Profs Richards, Williamson, Clingingsmith, Maddison, Richards, Javier Cuenca Esteban and others. Some of the quotations are as follows:

- Prof. Williamson and Clingingsmith[14] have noted that "between 1772 and 1815 there was a huge net financial transfer from India to Britain in the form of Indian goods. The "drain resulting from contact

with the West was the excess of exports from India for which there was no equivalent import" included "a bewildering variety of cotton goods for re-export or domestic [consumption], and the superior grade of saltpeter that gave British cannon an edge."

- Javier Cuenca Esteban[15] estimates these net financial transfers from India to Britain reached a peak of £1,014,000 annually in 1784-1792 before declining to £477,000 in 1808-1815."
- Maddison[16] has mentioned the debilitating effect of the drain of funds from India: "Another important effect of foreign rule on the long-run growth potential of the economy was the fact that a large part of its potential savings was siphoned abroad. This 'drain' of funds from India to the UK has been a point of major controversy between Indian nationalist historians and defenders of the British-raj. However, the only real grounds for controversy are statistical. There can be no denial that there was a substantial outflow which lasted for 190 years. If these funds had been invested in India they could have made a significant contribution to raising income levels."
- The total 'drain' due to government pensions and leave payments, interest on non-railway official debt, private remittances for education and savings, and a third commercial profits amounted to about 1.5 per cent of national income of undivided India from 1921 to 1938 and was probably a little larger before that... about a quarter of Indian savings were transferred out of the economy, and foreign exchange was lost which could have paid for imports of capital goods.
- Dadabhai Naoroji[17] estimated the drain of resources from India to the extent of Rs. 12, 000,000 annually. Here is an extract from one of his essays, "The Benefits of British Rule, 1871".

  "*Financially:* All attention is engrossed in devising new modes of taxation, without any adequate effort to increase the means of the people to pay; and the consequent vexation and oppressiveness of the taxes imposed, imperial and local. Inequitable financial relations between England and India, i.e., the political debt of Rs. 100,000,000 clapped on India's shoulders and all home charges.

  Materially: The political drain, up to this time, from India to England, of above Rs. 500,000,000, at the lowest computation, in principal alone...The further continuation of this drain at the rate, at present, of above Rs. 12,000,000 per annum, with a tendency to increase."

Conclusion

Sir Isaac Newton has dealt with Indian coins during his tenure as a warden and Master of the Royal Mint at London. His attempt to improve purity of British gold coins and disappearance of gold coins from India could be a coincidence, but a process happened to be incidental or ancillary to such act.

Sir Walter Elliot recorded as to ho he got valuable Pallava coins including that of "ship-type" (made of Copper) just by giving the "daily-requirements" to the Tamilnadu fishermen. However, the gold coins could not have been obtained through such barter, but cold act of seizure, loot or such other process leading to illegal export to England. The EIC officials might or might not have revealed their booty, thus, many gold coins could have escaped from the official accounting. Ever since the advent of Europeans and European Companies in India, the instances of European Officers taking valuables along with them had been a regular feature. Thus, the important point of disappearance of valuable historical evidences in the context has also to be noted.

In any case, the melting of them for metal value has been evident under the circumstances stated and explained. The drain of India has already been linked with the sudden prosperity of England with many revolutions occurring immediately. The 18th century efforts of introduction of gold standard, new coinage and related growing economy correlated with the events of India poses a clear picture of harassment of India in all aspects. Thus, Newton was used professionally in this regard.

Notes and References

1. K. V. Ramakrishna Rao, *Sir Isaac Newton and India*, Bharatiya Baudhhik Sampada, August 2004, Nagpur, pp. 8-24 and 29.

2. Sir Isaac Newton, *The Chronology of Ancient Kingdoms Amended*, see the NEWTON PROJECT website.
3. *www.umich.edu/~ece/student_projects/money/denom.html*
4. *http://www.pierre-marteau.com/editions/1701-25-mint-reports-1717-09-25.html*
5. K. V. Ramakrishna Rao, *The Appearance and Disappearance of Ancient Coins in India*, to appear in Numismatics Studies in the New Millennium, a Festschrift to Dr. Raja Reddy.
6. Thomas Babington Macaulay, *The History of England from the Accession of James the Second*, Vol. IV, pp. 712-713. For differing views about the appointment of Newton as "Master of Royal Mint", see: *http://www.nalanda.nitc.ac.in/resources/english/etext-project/history/England/chapter6.html*
7. Newton's activities in pursuing coinage offenders have been much commented on: see especially Craig, NATM, 17-21, Cairg's two articles "Isaac Newton – Crime Investigator", Nature 182 (1958) and "Sir Isaac Newton and Counterfeiters", Notes and Records of the Royal Society 18 (1963), and Westfall, 567-575.
   Frank E. Manuel makes some intriguing speculations about Newton's underlying motives in "A Portrait of Isaac Newton" (Cambridge, Mass.1968), 234-235.
   A great deal of the relevant documentation is not in Newton's own papers, but in PRO, Mint, 15/17.
8. *www.umich.edu/~ece/student_projects/money/denom.html*
9. For "Guinea", it is explained that original the metal required for minting coins was imported from Africa.
10. For the letter dated September 25th, 1717 of Newton, see: *http://www.pierre-marteau.com/editions/1701-25-mint-reports/report-1717-09-25.html* William A. Shaw, *Select Tracts and Documents Illustrative of English Monetary History 1626-1730*, London: Wilsons & Milne, 1896 [reprint: (New York: Augustus Kelley Publishers, 1967)], p.166-171 — webdesign: Olaf Simons, Sep. 2004.
11. Shaw (ed), *Excerpts from John Conduit's Treatise, "Observations upon the present state of Our Gold and Silver Coins"*, 1896, pp.181-214. See the following website: *http://www.gold.org/value/reserve_asset/history/monetary_history/vol1/1730.html*
12. William A. Shaw, *Select Tracts and Documents Illustrative of English Monetary History 1626-1730* (London: Wilsons & Milne, 1896) [reprint: (New York: Augustus Kelley Publishers, 1967)], p. 132-134 — html by Olaf Simons, Sep. 2004.
   For Newton's papers on Mint, refer to the following:

   Newton's step niece, Elizabeth Barton, daughter of his stepsister, Hannah Barton, married John Conduitt, who succeeded Newton in the Mastership of the Mint, on the latter's death. Conduitt's daughter Catherine married John Viscount Lymington, eldest son of the first Earl of Portsmouth, and carried with her into the Portsmouth family all Newton's papers. Of these papers the scientific portion has been presented to the Cambridge University Library. But the portion containing his official papers, mint documents and correspondence, etc., are still preserved in the library of the Earl of Portsmouth, Hurstbourne Park, Hampshire. The mint papers were arranged with loving care by Conduitt, and are now bound in three large folios. A glance at their contents (see *Historical Manuscripts Reports*, viii. 60) reveals the fact of Newton's immense industry in equipping himself for and in executing his office, and at the same time the smallness of the number of his papers which have survived in the national archives as compared with the drafts and reports which are preserved in these family papers. It would be gratifying if this attempt at a reproduction of the official papers of Newton should lead to something further.

   All merely administrative papers-such as relate to appointments of officers under Newton at the mint, or to the conduct of the Scotch mint, or to the management of the tin revenues of the Crown, on all which subjects numerous papers exist among the *Treasury Board Papers* — are here omitted. Those alone are printed in which Newton reports on questions relating to coinage or exchange. They will speak for themselves, with their masterly brevity and clearness. And if the train of thought which runs through this volume has been grasped, it will be at once apparent how different, and more expert and true, was his attitude of mind towards the monetary difficulty of his time than that of John Locke in 1696. It would be difficult to express sufficient admiration of the skill and modesty with which Newton pierced the secrets of the exchanger's craft.
13. Sanjay Garg, *'Sikka' and the Crown: Genesis of the Native Coinage Act, 1876*, Indian Economic and Social History Review, Vol. 35, Issue.4, Oct-Nov, 1998, pp. 359-388; also see in: *www.princelystates.com*
14. David Clingingsmith, Jeffrey G. Williamson, India's Deindustrialization in the 18th and 19th Centuries, Harvard University, August 2005. See the following: *http://post.economics.harvard.edu/faculty/jwilliam/papers/GEHNIndianDeind.pdf*

15. Javier Cuenca Esteban, *India's contribution to the British balance of payments, 1757-1812, October 2005*, XIV International Economic History Congress, Helsinki 2006, see in: http://www.helsinki.fi/iehc2006/papers3/Esteban.pdf Also, quoted by Richards in – *http://www.economics.harvard.edu/faculty/jwilliam/papers/w10586.pdf*
16. Madisson, *The Economic and Social Impact of Colonial Rule in India* (chapter 3 of Class Structure and Economics Growth: India and Pakistan since the Mughals), 1971.
17. Dadabhai Naoroji, *Essays, Speeches, Addresses and Writings*, Caxton Printing Works, Bombay, 1887, pp. 131-136. Also see: